

REMARKS

The Office Action of June 3, 2008, has been carefully considered.

Claims 1-8 and 10-12 have been rejected under 35 USC 103(a) over Tamamura et al, while Claim 9 has been rejected under 35 USC 103(a) over Tamamura et al in view of "Aluminum and Aluminum Alloys," page 45, or GB 605,282.

Several amendments have now been made to Claim 1. In particular, Claim 1 has been amended to require that the cast part be made by mold casting followed by solution heat treating, as disclosed, for example, in paragraphs [0045] and [0047] of the application as published. Claim 1 has further been amended to recite the presence of vanadium in the amount of 0.04-0.30% by weight, with the lower limit taken from Claim 9 as originally filed. Finally, Claim 1 has been amended to recite that the cast part has zirconium dispersion phases resulting from solution heat treating, and metastable θ - θ copper phases derived from Al_2Cu precipitation, as disclosed in paragraph [0035] of the application as published.

Claims 13 and 14 have been added, directed to aspects of the invention disclosed in paragraph [0047] of the published application.

In view of the amendment to Claim 1 requiring the presence of vanadium, the rejection of Claims 1-8 and 10-12 as obvious over Tamamura et al is believed to have been rendered moot, and the rejection of Claim 9 over Tamamura et al in view of "Aluminum and Aluminum Alloys," page 45, or GB 605,282 will be discussed.

The Office Action admits that Tamamura et al does not teach the addition of vanadium to the Tamamura et al alloy, but that "Aluminum and Aluminum Alloys" teaches that vanadium is added to aluminum in order to raise the recrystallization temperature and for grain refinement, and that GB '282 teaches

that vanadium is added as a grain refiner to Al-Si alloys (page 1, lines 47-54). It is alleged that it would therefore have been obvious to one of ordinary skill in the art to add the V as a grain refiner and in order to raise the recrystallization temperature of the Tamamura et al alloy.

As to the argument that vanadium is added to raise the recrystallization temperature, in the claimed type of Al- Si 4.5-10%- Cu 2-5% cast alloy, as in all Al-Si foundry alloys, recrystallization never occurs. Recrystallization is a phenomenon which occurs only in *wrought* alloys, or in high purity silicon-free foundry alloys such as AlCu5Mg with no Mn and with Fe < 0.05% by weight. Hence, while one of ordinary skill in the art might add vanadium to the *wrought* alloys of Tamamura et al, it would be understood that the addition of vanadium to the claimed *cast* alloys would not raise the recrystallization temperature, and hence there is no basis for adding vanadium to the claimed alloys.

Applicants moreover note that vanadium is not an effective grain refiner for AlSi foundry alloys, for which only a combination of a much larger amount of titanium than in wrought alloys, on the order of 0.03-0.25% and preferably 0.10-0.15%, combined with the addition of boron to form TiB_2 nuclei is effective as a grain refiner. The presence of vanadium may even be detrimental to grain refinement in AlSi foundry alloys, as vanadium tends to react with the added boron to form VB_2 to the detriment of TiB_2 . VB_2 is not an effective grain refiner for AlSi alloys.

Vanadium was actually added to the claimed alloys to improve creep strength, which is a different reason for the addition than those alleged in the Office action, and which is not disclosed or suggested in the cited art. Creep, moreover, is absolutely not improved by grain refinement and in most materials, grain refinement is detrimental to creep; that is

why single crystal structures are used for some very hot cast parts such as super alloy turbine blades.

Hence the disclosures of "Aluminum and Aluminum Alloys" and GB 605,282 would not lead one of ordinary skill in the art to add vanadium to cast alloys as are presently claimed, and withdrawal of this rejection is requested.

In view of the foregoing amendments and remarks, Applicants submit that the present application is now in condition for allowance. An early allowance of the application with amended claims is earnestly solicited.

Respectfully submitted,



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